REMARKS

Following entry of the above preliminary amendments, claims 54, 57-62, and 64-115 are now pending in this application and are presented for reconsideration.

Applicants thank the Examiner for granting a telephonic interview with Applicants' representative, Isabelle Blundell, on February 5, 2001. During the interview, it was noted that the cited references could be overcome by the filing of a continued prosecution application (CPA) as the new application would be entitled to the benefit of the provision of section 103(c) of the Title 35 of the United States Code as amended by the American Inventors Protection Act of 1999, section 4807 effective November 29, 1999. Also, certain claim terms were discussed with regards to the PNA probes, the detectable moieties, and their association to form labeled PNA probes of the invention.

Claim Amendments

Claim 62 is amended to delete improper reference to a method step. Claim 65 is amended to delete the Markush group and recite a specific detectable moiety. Remaining members of the Markush group are now set out in new claims 72-77. Claim 67 is amended to delete the term "injection" and substitute therewith the term "introduction" to reflect proper antecedent basis and correct a grammatical error. Claim 69 is amended to correct a typographical error. Applicants believe that no new matter is introduced by these amendments.

New claims 72 to 115 are added. New claims 72-111 are all depending from either claim 54, 57, 58, or 71, all previously pending independent claims. Claim 112 is a newly presented independent claim with claims 113-115 depending therefrom. Basis for these new claims can be found throughout the specification and in the original claims. Applicants believe that these new claims do not introduce new matter.

Rejection of Claims Under 35 USC § 103

Claims 57-66, 64, 65 and 67-71 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,630,924 to Fuchs et al. (Fuchs) alone. Applicants

respectfully submit that this reference is no longer available as prior art under the provision of 35 U.S.C. §103(c).

The inventors of the cited Fuchs reference and of the present application were under an obligation to assign their respective inventions to the same entity, i.e. PerSeptive Biosystems, Inc., at the time the inventions described in the cited reference and the present application were made.

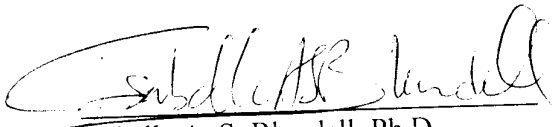
Claims 57-62, 64, 65, and 67-71 were further rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Fuchs taken in view of U.S. Patent No. 5,217,866 to Summerton et al. (Summerton). This rejection is obviated as the primary reference, Fuchs, is no longer available as prior art.

The newly presented claims 72-115 are similarly free of the prior art for the reasons stated above.

CONCLUSION

Applicants respectfully submit that this Preliminary Amendment places the pending claims in condition for allowance. The Examiner is cordially invited to contact the undersigned by any means indicated below, should, upon final review of this case, any impediment be found that would prevent this case from proceeding to allowance.

Respectfully submitted,



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Appendix A

62. (Amended) The microchip apparatus of claim 58 wherein said denaturing reagent comprises a low ionic strength buffer ~~that permits adjustment of the mixture resulting from step c) to low salt concentrations~~.

65. (Twice Amended) The microchip apparatus of claim 58 wherein the detectable moiety is ~~selected from the group consisting of~~ an enzymes~~, colored particles, fluorophores, biotin, chromophores, radioisotopes, electrochemicals and chemiluminescent moieties~~.

67. (Twice Amended) The microchip apparatus of claim 58 wherein each said capillary channel further ~~comprising~~ comprises a sample incubation zone disposed in communication with said sample ~~injection~~ introduction zone and said separation zone.

69. (Amended) The microchip apparatus of claim 68 wherein at least said sample introduction zone is in electrical connection with a high voltage and said detection zone is in electrical connection with each capillary channel ~~on~~ and ground.

Appendix B

54. (Amended) An apparatus comprising:

a) a sample introduction zone;

b) at least one PNA probe associated with a particle; and

c) a separation zone in communication with said introduction zone.

57. (Amended) An apparatus comprising:

a) a sample introduction zone;

b) a separation zone in communication with said introduction zone;

c) at least one PNA probe labeled with a detectable moiety, said PNA probe disposed upstream of said separation zone; and

d) a sample incubation zone disposed in communication with the sample introduction zone and in communication with the separation zone.

58. (Amended) A microchip apparatus comprising a plurality of capillary channels, each said capillary channel further comprising:

a) a sample introduction zone;

b) at least one PNA probe labeled with a detectable moiety, said PNA probe disposed to mix upstream of a separation zone with a sample introduced in each said introduction zone, said sample comprising at least one double stranded polynucleotide, said at least one PNA probe having a sequence complementary to a selected target sequence suspected to be present in said at least one double stranded polynucleotide;

c) a nucleic acid/nucleic acid denaturing reagent permitting the formation of a PNA probe/nucleic acid complex when said selected target sequence is present;

d) a detection zone; and

e) said separation zone in communication with said introduction zone and said detection zone.

59. (Amended) The microchip apparatus of claim 58 wherein the separation zone of at least one of said capillary channel comprises a sieving medium.

60. (Amended) The microchip apparatus of claim 59 wherein the sieving medium is selected from the group consisting of polyacrylamide, agarose, polyethylene oxide, polyvinyl pyrolidine and methylcellulose.

61. (Amended) The microchip apparatus of claim 58 wherein said denaturing reagent is selected from the group consisting of urea, formamide, and organic solvents.

62. (Twice Amended) The microchip apparatus of claim 58 wherein said denaturing reagent comprises a low ionic strength buffer.

63. (Canceled)

64. (Amended) The microchip apparatus of claim 58 wherein at least one of said at least one PNA probe comprises a charge-modifying moiety.

65. (Twice Amended) The microchip apparatus of claim 58 wherein the detectable moiety is an enzyme.

66. (Amended) The microchip apparatus of claim 58 wherein said at least one PNA probe is associated with a particle.

67. (Twice Amended) The microchip apparatus of claim 58 wherein each said capillary channel further comprises a sample incubation zone disposed in communication with said sample introduction zone and said separation zone.

68. The microchip apparatus of claim 58 further comprising an electric power supply coupled to the microchip apparatus.

69. (Amended) The microchip apparatus of claim 68 wherein at least said sample introduction zone is in electrical connection with a high voltage and said detection zone is in electrical connection with each capillary channel and ground.

70. The microchip apparatus of claim 58 wherein the microchip is coupled to a laser-induced-fluorescence detection system.

71. A microchip apparatus comprising a plurality of capillary channels, wherein each of said capillary channels further comprises:

a) a sample introduction zone;

b) at least one PNA probe labeled with a detectable moiety, said PNA probe disposed upstream of a separation zone; and

c) a detection zone; wherein said separation zone is in communication with said introduction zone and said detection zone.

72. (New) The microchip apparatus of claim 58 wherein the detectable moiety is a colored particle.

73. (New) The microchip apparatus of claim 58 wherein the detectable moiety is a fluorophore.

74. (New) The microchip apparatus of claim 58 wherein the detectable moiety is a chromophore.

75. (New) The microchip apparatus of claim 58 wherein the detectable moiety is a radioisotope.

76. (New) The microchip apparatus of claim 58 wherein the detectable moiety is an electrochemical moiety.

77. (New) The microchip apparatus of claim 58 wherein the detectable moiety is a chemiluminescent moiety.

78. (New) The microchip apparatus of claim 58 wherein the detectable moiety is biotin.

79. (New) The microchip apparatus of claim 58 wherein the detectable moiety is fluorescein.

80. (New) The microchip apparatus of claim 58 wherein the PNA probe is modified with the detectable moiety.

81. (New) The microchip apparatus of claim 58 wherein the detectable moiety is bound to the PNA probe.

82. (New) The microchip apparatus of claim 58 wherein the detectable moiety is associated to the PNA probe.

83. (New) The apparatus of claim 54 wherein the separation zone comprises a sieving medium.

84. (New) The apparatus of claim 83 wherein the sieving medium is selected from the group consisting of polyacrylamide, agarose, polyethylene oxide, polyvinyl pyrolidine and methylcellulose.

85. (New) The apparatus of claim 54 further comprising a denaturing reagent selected from the group consisting of urea, formamide, and organic solvents.

86. (New) The apparatus of claim 54 further comprising a low ionic strength buffer.

87. (New) The apparatus of claim 54 wherein said at least one PNA probe further comprises a charge-modifying moiety.

88. (New) The apparatus of claim 54 wherein the particle is a colored particle.

89. (New) The apparatus of claim 54 further comprising a sample incubation zone disposed in communication with said sample introduction zone and said separation zone.

90. (New) The apparatus of claim 54 further comprising a sample detection zone disposed in communication with said separation zone.

91. (New) The apparatus of claim 57 wherein the separation zone comprises a sieving medium.

92. (New) The apparatus of claim 91 wherein the sieving medium is selected from the group consisting of polyacrylamide, agarose, polyethylene oxide, polyvinyl pyrolidine and methylcellulose.

93. (New) The apparatus of claim 57 further comprising a denaturing reagent selected from the group consisting of urea, formamide, and organic solvents.

94. (New) The apparatus of claim 57 further comprising a denaturing reagent comprises a low ionic strength buffer.

95. (New) The apparatus of claim 57 wherein said at least one PNA probe comprises a charge-modifying moiety.

96. (New) The apparatus of claim 57 wherein the particle is a colored particle.

97. (New) The apparatus of claim 57 wherein the detectable moiety is a fluorophore.

98. (New) The apparatus of claim 57 wherein the detectable moiety is a chromophore.

99. (New) The apparatus of claim 57 wherein the detectable moiety is a radioisotope.

100. (New) The apparatus of claim 57 wherein the detectable moiety is an electrochemical moiety.

101. (New) The apparatus of claim 57 wherein the detectable moiety is a chemiluminescent moiety.

102. (New) The apparatus of claim 57 wherein the detectable moiety is biotin.

103. (New) The apparatus of claim 57 wherein the detectable moiety is fluorescein.

104. (New) The apparatus of claim 57 wherein the PNA probe is modified with the detectable moiety.

105. (New) The apparatus of claim 57 wherein the detectable moiety is bound to the PNA probe.

106. (New) The apparatus of claim 57 wherein the detectable moiety is associated to the PNA probe.

107. (New) The apparatus of claim 57 further comprising a sample detection zone disposed in communication with said separation zone.

108. (New) The microchip apparatus of claim 71 wherein the detectable moiety is bound to the PNA probe.

109. (New) The microchip apparatus of claim 71 wherein the PNA probe is bound to biotin.

110. (New) The microchip apparatus of claim 71 wherein the PNA probe is bound to fluorescein.

111. (New) The microchip apparatus of claim 71 wherein the PNA probe is modified with the detectable moiety.

112. (New) An apparatus comprising:

a. a sample introduction zone;

b. a separation zone in communication with said introduction zone;

c. at least one PNA probe modified with a label, said label comprising a detectable moiety, said PNA probe disposed upstream of said separation zone; and

d. a sample incubation zone disposed in communication with the sample introduction zone and in communication with the separation zone.

113. (New) The apparatus of claim 112 wherein the detectable moiety is bound to the PNA probe.

114. (New) The apparatus of claim 112 wherein the PNA probe is bound to biotin.

115. (New) The apparatus of claim 112 wherein the PNA probe is bound to fluorescein.